# INPUT
# Terms and Definitions

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## Information Services Market Analysis Program

### INPUT Terms and Definitions

# Table of Contents

# Exhibits

# Definition of Terms

## A
## Introduction

INPUT's *Definition of Terms* provides the framework for all of INPUT's market analyses and forecasts of the information services industry. It is used for all U.S. programs, in Europe, and for INPUT's worldwide forecasts. The information services industry structure is diagrammed in Exhibit 1.

One of the strengths of INPUT's market analysis services is the consistency of the underlying market sizing and forecast data. Each year INPUT reviews its industry structure and makes changes if they are required. When changes are made, they are carefully documented and the new definitions and forecasts reconciled to the prior definitions and forecasts. INPUT clients have the benefit of being able to track market forecast data from year to year against a proven and consistent foundation of definitions.

## B
## Overall Definitions and Analytical Framework

### 1. Information Services

*Information Services* are computer/telecommunications-related products and services that are oriented toward the development or use of information systems. Information services typically involve one or more of the following:

- Packaged software products, including systems software or applications software (called *Software Products*)

- A combination of computer equipment, packaged software and associated support services that will meet an application systems need (called *Turnkey Systems*)

- People services that support users in developing and operating their own information systems (called *Professional Services*)

- A combination of products (software and equipment) and services in which the vendor assumes total responsibility for the development of a custom integrated solution, or part of a solution, to an information systems need (called *Systems Integration*)

- Services that provide operation and management of all or a significant part of a user's information systems or telecommunications functions under a long-term contract (called *Outsourcing*)

- Use of vendor-provided computer processing services to develop or run applications or provide services such as disaster recovery or data entry (called *Processing Services*)

- *Network Services* has two components:

  - Services that support the delivery of information in electronic form— typically network-oriented services such as value-added networks and electronic mail (called *Network Applications*)

  - Services that support the access and use of public and proprietary information such as on-line databases and news services (called *Electronic Information Services*)

- Services that support the operation and maintenance of computer and digital communication equipment (called *Equipment Services*)

In general, the market for information services does not involve providing equipment to users. The exception is when the equipment is part of an overall service offering such as a turnkey system, an outsourcing contract, or a systems integration project.

The information services market also excludes pure data transport services (i.e., data or voice communications circuits such as T-1 carriers). However, where information transport is associated with a network-based service (e.g., electronic data interchange services), or cannot feasibly be separated from other bundled services (e.g., some outsourcing contracts), the transport costs are included as part of the information services market.

The analytical framework of the information services industry consists of the following interacting factors: overall and industry-specific business environment (trends, events and issues); technology environment; user information system requirements; size and structure of information services markets; vendors and their products, services and revenues; distribution channels; and competitive issues.

## 2.  Market Forecasts/User Expenditures

All information services market forecasts are estimates of user expenditures for information services expressed as *Market Size*. When questions arise about the proper place to count these expenditures, INPUT addresses them from the user's viewpoint—that is, expenditures are categorized according to what users perceive they are buying.

By focusing on user expenditures, INPUT avoids two problems that are related to the distribution channels for various categories of services:

- Double counting, which can occur by estimating total vendor revenues when there is significant reselling within the industry (e.g., software sales to turnkey vendors for repackaging and resale to end users)

- Missed counting, which can occur when sales to end users go through indirect channels such as mail order retailers

*Captive Information Services User Expenditures* are expenditures for products and services provided by a vendor that is part of the same parent corporation as the user. These expenditures are not included in INPUT forecasts.

*Noncaptive Information Services User Expenditures* are expenditures that go to vendors that have a different parent corporation than the user. It is these expenditures, generally regarded as open to competitive bid, that constitute the information services market analyzed by INPUT and that are included in INPUT forecasts.

## 3.  Product/Service Categories

*Product/Service Categories* are defined as groupings of products and services that satisfy a given user need. While *Market Sectors* specify *who* the buyer is, *Product/Service Categories* specify *what* the user is buying.

Of the nine product/service categories defined by INPUT, six are considered primary products or services:

- *Processing Services*
- *Network Services*
- *Professional Services*
- *Applications Software Products*
- *Systems Software Products*
- *Equipment Services*

The remaining three product/service categories represent combinations of these products and services, in conjunction with equipment, management and/or other services:

- *Turnkey Systems*

- *Outsourcing*

- *Systems Integration*

Section C describes the product/service categories and their structure in more detail.

## 4. Market Sectors

*Market Sectors,* or markets, are groupings of the buyers of information services. There are three types of user markets:

- *Vertical Industry* markets, such as banking and finance, transportation, utilities, etc. These are called "industry-specific" markets.

- *Functional Application* markets, such as human resources, accounting, etc. These are called "cross-industry" markets.

- *Other markets*, which are neither industry- nor application-specific, such as the market for systems software products and much of the on-line database market.

Specific market sectors used by INPUT are defined in Section E, below.

## 5. Trading Communities

Information technology is playing a major role in reengineering, not just companies, but the value chain or *Trading Communities* in which these companies operate. This reengineering is resulting in electronic commerce emerging where interorganizational electronic systems facilitate the business processes of the trading community.

- A trading community is the group or organizations—commercial and non-commercial—involved in producing goods or services.

- Electronic commerce and trading communities are addressed in INPUT's Electronic Commerce Program.

### 6. The Internet

The Internet is expected to be a major, if not the dominant, communications and applications resource of the next millennium. Although in the mid-1990s Internet commercial applications are limited, by the year 2000 the World Wide Web (WWW) and the Internet are expected to be the applications and communications platforms of preference for not only American business, but also for global commerce, personal computing and communications activities. As a platform that facilitates communications between businesses, the Internet will have an impact on each of the nine product/service categories diagrammed in INPUT's information services industry structure chart (Exhibit 1). Internet-related expenditures will be subsets of the appropriate product/service category or subcategory, as determined by their use with or applicability to Internet-based or -related business activities. Because of the ubiquitous nature of the Internet and Internet-related information services spending, no separate Internet definitions will be provided in this *Definitions* book, since, depending upon context, any of INPUT's information services categories could have Internet applicability.

## C
## Product/Service Categories and Subcategories

Exhibit 1 provides the overall structure of the information services industry as defined and used by INPUT. This section of the *Definition of Terms* provides definitions for each of the product/service categories and their submodes or components.

Exhibit 1

## Information Services Industry Structure 1996

| Systems Software | Applications Software | Turnkey Systems | Professional Services | Systems Integration | Outsourcing | Processing Services | Network Services (including Internet) | Equipment Services |
|---|---|---|---|---|---|---|---|---|
| Systems Control | Enterprise Servers | Equipment | IS Consulting | Equipment | Platform | Transaction | Electronic Information Services | Enterprise Servers |
| Operations Management | Departmental Servers | Software Products | Education & Training | Software Products | Applications | Utility | Network Applications | Departmental Servers |
| Applications Development Tools | Clients | Professional Services | Software Development | Professional Services | Desktop Services | Other | | Clients |
| Database Management | | | | Other | Network Management | | | Environmental Services |
| | | | | | Applications Management | | | |
| | | | | | Business Operations | | | |

Source: INPUT

### 1. Software Products

INPUT divides the software products market into two product/service categories: systems software and applications software.

The two categories have many similarities. Both involve purchases of software packages for in-house computer systems. Included are both lease and purchase expenditures, as well as expenditures for work performed by the vendor to implement or maintain the package at the user's sites. Vendor-provided training or support in operation and use of the package, if part of the software pricing, is also included here.

Expenditures for work performed by organizations other than the package vendor are counted in the professional services delivery mode. Fees for work related to education, consulting, and/or custom modification of software products are also counted as professional services, provided such fees are charged separately from the price of the software product itself.

### a. Systems Software Products

Systems software products enable the computer/communications system to perform basic machine-oriented or user interface functions. INPUT divides systems software products into four submodes. See Exhibit 2.

- *Systems Control Products* - Software programs that manage computer system resources and control the execution of programs. These products include operating systems, emulators, network control, library control, windowing, access control, and spoolers.

- *Operations Management Tools* - Software programs used by operations personnel to manage the computer system and/or network resources and personnel more effectively. Included are performance measurement, job accounting, computer operation scheduling, disk management utilities, and capacity management.

- *Applications Development Tools* - Software programs used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Included are traditional programming languages, 4GLs, data dictionaries, database management systems, report writers, project control systems, CASE systems and other development productivity aids.

- *Database Management Systems* - Database management systems (DBMSs), data dictionaries and database-related management software

Exhibit 2

**Systems Software Products Market Structure**

```
                        Systems
                        Software

    ┌──────────────┬──────────────┬──────────────┐

   Systems        Operations     Applications      Database
   Control        Management     Development       Management
                  Control        Tools             Systems
```

| | | | |
|---|---|---|---|
| • Access Control<br>• Communications Monitors<br>• Micro-Mainframe Links<br>• Network Control<br>• Operating Systems<br>• Security Systems<br>• System Library Control<br>• Windowing Systems<br>• Other | • Capacity Managemement<br>• Computer Operations<br>  Scheduling<br>• Data Center Management<br>• Disk Management<br>• Downtime/Repair<br>  Monitoring Management<br>• Job Accounting<br>• Performance Monitors<br>• Tape Management<br>• Utilities<br>• Other | **Program<br>Development and<br>Production Tools**<br><br>• Applications Generators<br>• Assemblers<br>• Automatic Documentation<br>• Configuration Management<br>• Debugging Aids<br>• Languages<br>  (All Generations)<br>• System Development<br>  Control<br>• Retrieval Systems<br>• Translators<br>• 4GL<br>• I-CASE<br>• Other | • Database Management<br>  Systems<br>• Data Dictionaries<br>• Other |

*Source: INPUT*

INPUT also forecasts systems software products by platform: mainframe, minicomputer and workstation/PC. These terms reflect a traditional view of processing platforms based upon size or computational capability. In 1996 reports, INPUT will use more contemporary terms for the three platforms based upon functionality, not size or processing power. These will be: enterprise server, departmental server and client.

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### b. Applications Software Products

Applications software products enable a user or group of users to support an operational or administrative process within an organization. Examples include accounts payable, order entry, project management and office systems. INPUT categorizes applications software products into two groups (see Exhibit 3):

- *Industry Specific Applications Software Products* - Software products that perform functions related to fulfilling business or organizational needs unique to a specific industry (or vertical) market and sold to that market only. Examples include software products to perform such functions as demand deposit accounting, MRPII, medical record keeping, automobile dealer parts inventory, etc.

- *Cross-Industry Applications Software Products* - Software products that perform a specific function that is applicable to a wide range of industry sectors. Examples include payroll and human resource systems, accounting systems, word processing and graphics systems, spreadsheets, etc.

INPUT also forecasts the applications software product/service category by functional platform: enterprise server, departmental server, and client.

### 2. Turnkey Systems

A turnkey system integrates equipment (e.g., CPU, peripherals), systems software, and packaged applications software into a single product developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily in the software and professional services provided. INPUT classifies turnkey systems into two groups, as it does for applications software products (see Exhibit 3)—those systems that are industry-specific and those applicable to the cross-industry markets. Many CAD/CAM systems and small business systems are turnkey systems.

Exhibit 3

**Application Products and Turnkey Systems Market Structure**



- Discrete Manufacturing
- Process Manufacturing
- Transportation
- Utilities
- Telecommunications
- Retail Trade
- Wholesale Trade
- Banking and Finance
- Insurance
- Health Services
- Education
- Business Services
- Federal Government
- State and Local Government
- Miscellaneous Industries

**Office Systems**
- Integrated Office Systems
- Word Processing
- Desktop Publishing
- Image Systems
- Electronic Publishing
- Document Imaging Software

**Accounting**
- General Ledger
- Accounts Payable
- Accounts Receivable
- Billing/Invoicing
- Costing
- Fixed Assets
- International Accounting
- Purchasing
- Taxation

**Human Resources**
- Human Resoures Management
- Payroll
- Benefits

**Education and Training**
- Computer-Based Training
- Authoring
- Languages

**Planning and Analysis**
- Executive Information Systems
- Financial Modeling and Planning
- Spreadsheets
- Project Management

**Engineering and Scientific**
- Computer-Aided Design and Engineering
- Structural Analysis
- Statistics/ Mathematics/ Operations Research
- Mapping

**Other Cross-Industry**
- Marketing Management
- Sales Analysis

*Source: INPUT*

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Computer manufacturers (e.g., IBM or Apple) that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included in the appropriate software category.

Most turnkey systems are sold through channels known as value-added resellers (or VARs) and defined below:
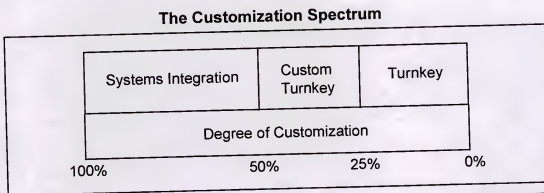
- *Value-Added Reseller (VAR)* - A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually applications software for a vertical or cross-industry market, but also may include many of the other components of a turnkey systems solution, such as professional services, software support, and applications upgrades.

Turnkey systems have three components:

- *Equipment* - computer hardware supplied as part of the turnkey system

- *Software Products* - prepackaged systems and applications software products

- *Professional Services* - services to install or customize the system or train the user, provided as part of the turnkey system sale

Exhibit 4 contrasts turnkey systems with systems integration. Turnkey systems are based on available software products that a vendor may modify to a modest degree.
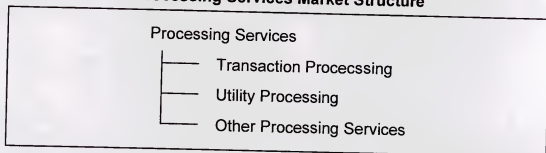
Exhibit 4

**The Customization Spectrum**

| Systems Integration | Custom Turnkey | Turnkey |
|---|---|---|
| Degree of Customization | | |

100%                          50%           25%              0%

*Source: INPUT*

### 3. Processing Services

This product/service category includes three subcategories: transaction processing, utility processing, and "other" processing services. See Exhibit 5.

Exhibit 5

**Processing Services Market Structure**

Processing Services
- Transaction Procecssing
- Utility Processing
- Other Processing Services

*Source: INPUT*

The three processing services subcategories are:

- *Transaction Processing* - The client uses vendor-provided information systems—including hardware, software and/or data networks—at the vendor or customer site to process specific applications and update client databases. The application software is typically provided by the vendor.

- *Utility Processing* - The vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), enabling clients to develop and/or operate their own programs or process data on the vendor's system.

- *Other Processing Services* - The vendor provides a service—usually at the vendor site—such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services. This category also includes backup, contingency and disaster recovery services.

## 4. Outsourcing

Outsourcing (previously called Systems Operations and Facilities Management) was introduced as a product/service category in the 1990 Market Analysis and Systems Operations programs.

Outsourcing is a long-term (greater than one year) relationship between a client and a vendor in which the client delegates all, or a major portion, of an operation or function to the vendor. The operation or function may either be solely information systems outsourcing-based, or include information systems outsourcing as a major component (at least 30%) of the operation.

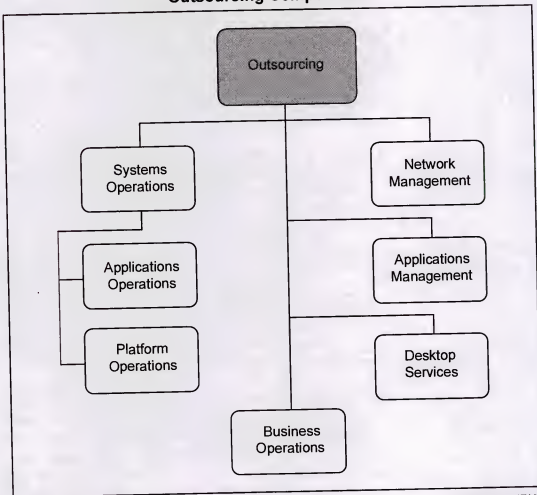The critical components that define an outsourcing service are:

- Delegating an identifiable area of the operation to a vendor

- Single-vendor responsibility for performing the delegated function

- Intended, long-term relationship between the client and the vendor, where:
  - The contract term is for at least one year
  - The client's intent is not to perform the function with internal resources

- The contract may include non-information systems outsourcing activities, but information systems outsourcing must be an integral part of the contract.

For 1996, the outsourcing product/service subcategories have been defined as shown in Exhibit 6 and defined below:

Exhibit 6

**Outsourcing Components**



Source: INPUT

- *Platform Operations* - The vendor manages and operates the computer systems, to perform the client's business functions, without taking responsibility for the client's application systems.

- *Applications Operations* - The vendor manages and operates the computer systems to perform the client's business functions, and is also responsible for maintaining, or developing and maintaining, the client's application systems.

- *Network Management* - The vendor assumes responsibility for operating and managing the client's data communications systems. This may also include the client's voice communications resources. A network management outsourcing contract may include only the management services or it may cover the full costs of the communications services and equipment plus the management services.

- *Desktop Services* - The vendor assumes responsibility for the deployment, maintenance, and connectivity among the personal computers and/or workstations in the client organization. The services may also include performing the help-desk function. Equipment as well as services can be part of a desktop services outsourcing contract.

  Note: This type of client service can also be provided through traditional professional services where the contractual criteria of outsourcing are not present.

- *Applications Management* - The vendor has full responsibility for maintaining and upgrading some or all of the application systems that a client uses to support business operations and may also develop and implement new application systems for the client.

  An applications management contract differs from traditional software development in the form of the client/vendor relationship. Under traditional software development services, the relationship is project based. Under applications management, it is time and function based.

  These services may be provided in combination or separately from platform outsourcing.

- *Business Operations* - Business operations outsourcing (also known as business outsourcing or functional outsourcing) is a relationship in which one vendor is responsible for performing an entire business/operations function, including the information systems outsourcing that supports it. The information systems outsourcing content of such a contract must be at least 30% of the total annual expenditure in order for INPUT to include it in the outsourcing market. Examples of business operations that are outsourced include telephone company billing and employee benefits processing.

Outsourcing vendors now provide a wide variety of services in support of existing information systems. The vendor can plan, control, provide, operate, maintain and manage any or all components of the client's information systems environment (equipment, networks, applications systems), either at the client's site or the vendor's site.

Note: In the federal government market, systems operation services are also defined by equipment ownership with the terms "COCO" (Contractor-Owned, Contractor-Operated), and "GOCO" (Government-Owned, Contractor-Operated).

### 5. Systems Integration (SI)

Systems integration is a vendor service that provides a complete solution to an information system, networking, or automation development requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price.

The components of a systems integration project (see Exhibit 7) are the following:

- *Equipment* - The information processing and communications equipment required to build the systems solution. This component may include custom as well as off-the-shelf equipment to meet the unique needs of the project. The systems integration equipment category excludes turnkey systems by definition.

- *Software Products* - Prepackaged applications and systems software products.

- *IT-Related Professional Services* - The value-added component that adapts the equipment and develops, assembles, or modifies the software and hardware to meet the system's requirements. It includes all of the professional services activities required to develop, implement, and, if included in the contract, operate an information system, including consulting, program/project management, design and integration, software development, education and training, documentation, and outsourcing and maintenance.

- *Other Products and Services* - Most systems integration contracts include other services and product expenditures that are not classified elsewhere. This category includes miscellaneous items such as engineering services,

automation equipment, computer supplies, business support services and supplies, and other items required for a smooth development effort.

Exhibit 7

**Products and Services Included in
Systems Integration Projects**

*Equipment*
• Information systems
• Communications

*Software Products*
• Systems software
• Applications software

*IT Related Professional Services*
• Consulting
 - Feasibility and trade-off studies
 - Selection of equipment, network and software
• Program/project management
• Design/integration
 - Systems design
 - Installation of equipment, network, and software
 - Demonstration and testing
• Software development
 - Modification of software packages
 - Modification of existing software
 - Custom development of software
• Education/training and documentation
• Systems operation/maintenance

*Other Miscellaneous Products/Services*
• Site preparation
• Data processing supplies
• Processing/network services
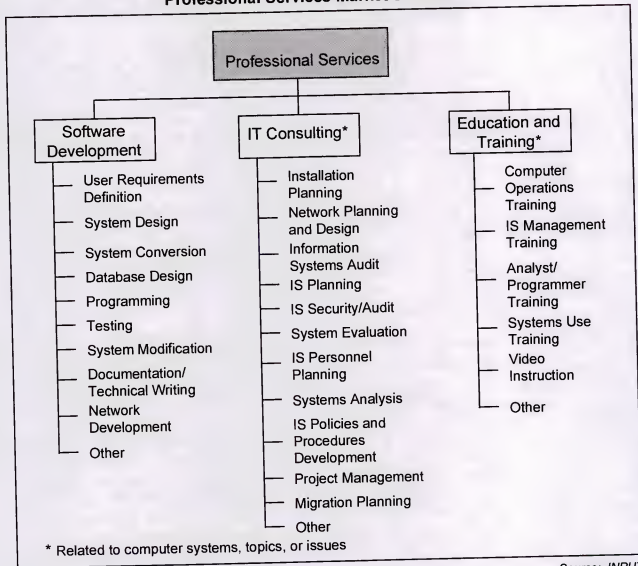• Data/voice communication services

*Source: INPUT*

### 6. Professional Services

This product/service category includes three subcategories: consulting, education and training, and software development. Exhibit 8 provides additional detail.

Exhibit 8

**Professional Services Market Structure**

```
                        Professional Services
        ┌───────────────────────┼───────────────────────┐
  Software                  IT Consulting*           Education and
  Development                                         Training*

  — User Requirements       — Installation           — Computer
    Definition                Planning                  Operations
  — System Design           — Network Planning          Training
  — System Conversion         and Design             — IS Management
  — Database Design         — Information               Training
  — Programming               Systems Audit          — Analyst/
  — Testing                 — IS Planning              Programmer
  — System Modification     — IS Security/Audit        Training
  — Documentation/          — System Evaluation      — Systems Use
    Technical Writing       — IS Personnel             Training
  — Network                   Planning               — Video
    Development             — Systems Analysis         Instruction
  — Other                   — IS Policies and        — Other
                              Procedures
                              Development
                            — Project Management
                            — Migration Planning
                            — Other
```

\* Related to computer systems, topics, or issues

*Source: INPUT*

The three subcategories are defined as follows:

- *IT Consulting* - Services include information technology consulting (related only to information systems, and not general business consulting) in a broad range of areas, including planning, design, audit, evaluation and analysis; information systems re-engineering; feasibility analysis and cost-effectiveness studies; and project management assistance. Services may be related to any aspect of the information system, including equipment, software, networks and outsourcing.

- *Education and Training* - Services that provide training and education or the development of training materials related to information systems and services for the information systems professional and the user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation. Education and training provided by school systems is not included. General education and training products are included as a cross-industry market sector.

- *Software Development* - Services include user requirements definition, systems design, contract programming, documentation, and implementation of software, performed on a custom basis. Conversion and maintenance services are also included.
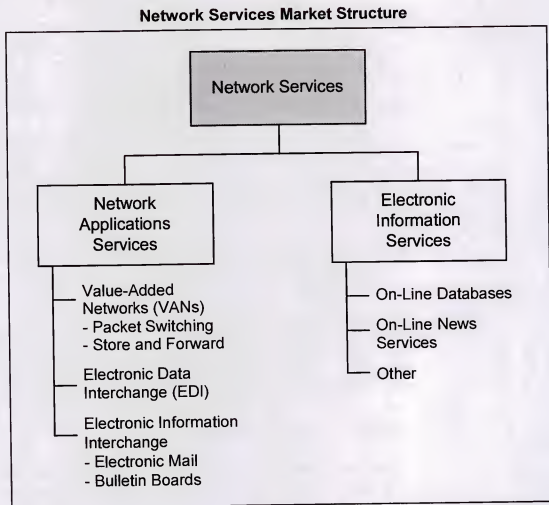
## 7. Network Services

Network services include a variety of telecommunications-based functions and operations, including those related to the Internet. This category includes two subcategories, as diagrammed in Exhibit 9. Each is defined in greater detail below.

*Electronic Information Services* - Electronic information services are data bases that provide specific information via terminal- or computer-based inquiry, including topics such as stock prices, legal precedents, economic indicators, periodical literature, medical diagnosis, airline schedules, and automobile valuations. The terminals used may be computers themselves, such as communications servers or personal computers.

Users inquire into and extract information from the databases and they may load extracted data into their own computer systems. The vendor does not provide data processing or manipulation capability as part of the electronic information service and users cannot update the vendor's databases. However, the vendor may offer other services (network applications or processing services) that do offer processing or manipulation capability.

Exhibit 9

**Network Services Market Structure**



*Source: INPUT*

The two major categories of electronic information services are:

- *On-line Databases* - Structured, primarily numerical data on economic and demographic trends, financial instruments, companies, products, materials, etc.

- *On-line News (Text) Services* - Unstructured, primarily textual information on people, companies, events, etc. These are most often news services.

While electronic information services have traditionally been delivered via networks, there is a growing trend toward the use of CD ROM (optical disks) to support or supplant on-line services, and these optical disk-based systems are included in the definition of this delivery mode.

*Network Applications Services* - The three types of network applications services are:

- *Value-Added Network Services (VAN Services)* - VAN services are enhanced transport services that involve adding such functions as automatic error detection and correction, protocol conversion, and store-and-forward message switching to the provision of basic network circuits.

  VAN services were originally provided only by specialized VAN carriers (e.g., Tymnet and Telenet); today, these services are also offered by traditional common carriers (e.g., AT&T and Sprint).  Meanwhile, the VAN carriers have also branched into the traditional common carriers' markets and are offering unenhanced basic network circuits as well.

- *Electronic Data Interchange (EDI) Services*- Application-to-application electronic exchange of business data between trade partners or facilitators using a telecommunications network.

- *Electronic Information Interchange*- The transmission of messages across an electronic network managed by a services vendor, including electronic mail, voice mail, voice messaging, and access to Telex, TWX, and other messaging services.  This also includes bulletin board services.

## 8. Equipment Services

The equipment services product/service category includes two subcategories. Both deal with the support and maintenance of computer equipment.

- *Equipment Maintenance* - Services provided to repair, diagnose problems, and provide preventive maintenance both onsite and offsite for computer equipment.  The costs of parts and other supplies are excluded.  These services typically are provided on a contract basis.  Equipment is divided into three broad groupings, depending upon function: enterprise servers, departmental servers, and clients.  These functional definitions replace INPUT's earlier platform-related categories of mainframe, minicomputer, and workststation/PC, respectively.

- *Environmental Services* - These services comprise equipment and data center-related special services such as cabling, air conditioning and power supply, equipment relocation, and similar services.

# D

## Computer Equipment

These definitions have been included to provide the basis for market segmentation in the software products markets.

- *Computer Equipment* - Includes all computer and telecommunications equipment that can be separately acquired with or without installation by the vendor and not acquired as part of an integrated system. Unless otherwise noted in an INPUT forecast, computer equipment is only included where it is part of the purchase of services or software products (e.g., turnkey systems and systems integration).

- *Peripherals* - Includes all input, output, communications, and storage devices (other than main memory) that can be channel-connected to a processor, and generally cannot be included in other categories such as terminals

- *Input Devices* - Includes keyboards, numeric pads, card readers, light pens and track balls, tape readers, position and motion sensors, and analog-to-digital converters

- *Output Devices* - Includes printers, CRTs, projection television screens, micrographics processors, digital graphics, and plotters

- *Communication Devices* - Includes modems, encryption equipment, special interfaces, and error-control devices.

- *Storage Devices* - Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), bubble and optical memories, and mass storage devices

- *Computer Systems* - Includes all processors, from personal computers to supercomputers. Computer systems may require type- or model-unique operating software to be functional. This category excludes applications software and peripheral devices and processors or CPUs not provided as part of an integrated (turnkey) system.

- *Personal Computers* (PCs) - Smaller computers using 8-, 16-, or 32-bit computer technology, generally designed as desktop or laptop devices—e.g., to sit on a desktop or as a portable for individual use. Prices are generally less than $3,000. These devices form the bulk of the clients in a client/server environment.

- *Workstations* - High-performance, desktop, single-user computers often employing Reduced Instruction Set Computing (RISC). Workstations provide integrated, high-speed, local network-based services such as

database access, file storage and backup, remote communications, and peripheral support. These products usually cost from $5,000 to $15,000.

- *Departmental Servers* - These are generally minicomputers or midsized computers priced from $5,000 to $350,000. Many client/server computers are in this category.

- *Enterprise Servers* - Traditional mainframe and supercomputers costing more than $350,000.

- *Client/server computing* - Client/server is an architecture that assembles applications software and databases, systems software, and computer and networking equipment into a usable form for the purpose of leveraging information technology investments. Broadly defined, it can include any kind of server, such as file servers and network servers, that are accessed by any kind of client, including a nonintelligent terminal. INPUT has elected to use the narrower and newer definition, by which application and data processing is shared between a client and a server. It is through the act of sharing that the greatest benefit is derived in terms of leveraging information technology investments. It is also the cause of the greatest change for vendors and users. As noted above, using client/server terminology, computers can be segmented into three broad categories—enterprise servers, departmental servers and clients—roughly corresponding to the platform categories: mainframes, minicomputers and workstation/PCs.

## E
## Sector Definitions

### 1. Industry Sector Definitions

INPUT structures the information services market into industry sectors such as process manufacturing, insurance, transportation, etc. The definitions of these sectors are based on the most recent revision of the Standard Industrial Classification (SIC) code system. The specific industries (and their SIC codes) included under these industry sectors are detailed in Exhibit 10.

INPUT includes all product/service categories except systems software products and equipment services in industry market sectors.

Note: SIC code 88 is Personal Households. INPUT does not currently analyze or forecast information services in this market sector.

Exhibit 10

## Industry Sector Definitions

| Industry Sector | SIC Code | Description |
|---|---|---|
| Discrete Manufacturing | 23xx | Apparel and other finished products |
| | 25xx | Furniture and fixtures |
| | 27xx | Printing, publishing, and allied industries |
| | 31xx | Leather and leather products |
| | 34xx | Fabricated metal products, except machinery and transportation equipment |
| | 35xx | Industrial and commercial machinery and computer equipment |
| | 36xx | Electronic and other electrical equipment and components, except computer equipment |
| | 37xx | Transportation equipment |
| | 38xx | Instruments; photo/med/optical goods; watches/clocks |
| | 39xx | Miscellaneous manufacturing industry |
| Process Manufacturing | 10xx | Metal mining |
| | 12xx | Coal mining |
| | 13xx | Oil and gas extraction |
| | 14xx | Mining/quarrying nonmetallic minerals |
| | 20xx | Food and kindred products |
| | 21xx | Tobacco products |
| | 22xx | Textile mill products |
| | 24xx | Lumber and wood products, except furniture |
| | 26xx | Paper and allied products |
| | 28xx | Chemicals and allied products |
| | 29xx | Petroleum refining and related industries |
| | 30xx | Rubber and miscellaneous plastic products |
| | 32xx | Stone, clay, glass and concrete |
| | 33xx | Primary metal industries |
| Transportation Services | 40xx | Railroad transport |
| | 41xx | Public transit/transport |
| | 42xx | Motor freight transport/warehousing |
| | 43xx | U.S. Postal Service |
| | 44xx | Water transportation |
| | 45xx | Air transportation (including airline reservation services in 4512) |
| | 46xx | Pipelines, except natural gas |
| | 47xx | Transportation services (including 472x, arrangement of passenger transportation) |

*Source: INPUT*

Exhibit 10 (continued)

## Industry Sector Definitions

| Industry Sector | SIC Code | Description |
|---|---|---|
| Telecommunications | 48xx | Communications |
| Utilities | 49xx | Electric, gas and sanitary services |
| Retail Trade | 52xx<br>53xx<br>54xx<br>55xx<br>56xx<br>57xx<br><br>58xx<br>59xx | Building materials<br>General merchandise stores<br>Food stores<br>Automotive dealers, gas stations<br>Apparel and accessory stores<br>Home furniture, furnishings and accessory stores<br>Eating and drinking places<br>Miscellaneous retail |
| Wholesale Trade | 50xx<br>51xx | Wholesale trade - durable goods<br>Wholesale trade - nondurable goods |
| Banking and Finance | 60xx<br>61xx<br>62xx<br><br>67xx | Depository institutions<br>Nondepository credit institutions<br>Security and commodity brokers, dealers, exchanges and services<br>Holding and other investment offices |
| Insurance | 63xx<br>64xx | Insurance carriers<br>Insurance agents, brokers and services |
| Health Services | 80xx | Health services |
| Education | 82xx | Educational services |

*Source: INPUT*

Exhibit 10 (continued)

## Industry Sector Definitions

| Industry Sector | SIC Code | Description |
|---|---|---|
| Business Services | 65xx | Real estate |
| | 70xx | Hotels, rooming houses, camps, and other lodging places |
| | 72xx | Personal services |
| | 73xx | Business services (except hotel reservation services in 7389) |
| | 7389 | Hotel reservation services |
| | 75xx | Automotive repair, services and parking |
| | 76xx | Miscellaneous repair services |
| | 78xx | Motion pictures |
| | 79xx | Amusement and recreation services |
| | 81xx | Legal services |
| | 83xx | Social services |
| | 84xx | Museums, art galleries, and botanical/zoological gardens |
| | 86xx | Membership organizations |
| | 87xx | Engineering, accounting, research, management, and related services |
| | 89xx | Miscellaneous services |
| Federal Government | 9xxx | |
| State and Local Government | 9xxx | |
| Miscellaneous Industries | 01xx | Agricultural production - crops |
| | 02xx | Agricultural production - livestock/animals |
| | 07xx | Agricultural services |
| | 08xx | Forestry |
| | 09xx | Fishing, hunting and trapping |
| | 15xx | Building construction - general contractors, operative builders |
| | 16xx | Heavy construction - contractors |
| | 17xx | Construction - special trade contractors |

*Source: INPUT*

## 2. Cross-Industry Sector Definitions

INPUT has identified seven cross-industry market sectors. These sectors or markets involve multi-industry applications such as human resource systems, accounting systems, etc. In order to be included in an industry sector, the service or product delivered must be specific to that sector only. If a service or product is used in more than one industry sector, it is counted as cross-industry.

INPUT only includes the turnkey systems, applications software products, and transaction processing services in the cross-industry sectors.

The seven cross-industry markets are:

### a. Accounting

Accounting consists of applications software products and information services that serve such functions as:

- General ledger

- Financial management

- Accounts payable

- Accounts receivable

- Billing/invoicing

- Fixed assets

- International accounting

- Purchasing

- Taxation

- Financial consolidation

Excluded are accounting products and services directed to a specific industry, such as tax processing services for CPAs and accountants within the business services industry sector.

### b. Human Resources

Human resources consists of application solutions purchased by multiple industry sectors to serve the functions of human resources management and payroll. Examples of specific applications within these two major functions are:

- Employee relations

- Benefits administration

- Government compliance

- Manpower planning

- Compensation administration

- Applicant tracking

- Position control

- Payroll processing

### c. Education and Training

Education and training consists of education and training for information systems professionals and users of information systems delivered as a software product, turnkey system, or through processing services. The market for computer-based training tools for the training of any employee on any subject is also included.

### d. Office Systems

Office systems consists of the following six categories:

(1) *Integrated Office Systems (IOSs)* - IOSs integrate the applications that perform common office tasks. Typically, these tasks include the following core applications, all of which are accessed from the same terminal, microcomputer, or workstation:

- Electronic mail

- Decision support systems

- Time management

- Filing systems

IOSs enable office workers to utilize applications that are resident on a number of hosts or servers, thus creating a corporate communication environment through integrating line-of-business software with personal software productivity tools. IOSs capitalize on the cross-platform architectures of major vendors. Major hardware vendors such as IBM, Data General, Digital, Hewlett-Packard and NCR all offer IOSs.

Workflow and groupware products are also included within the IOS definition.

(2) *Word Processing* - Word processing is the most common microcomputer application and is a basic application within the office systems sector. Word processing addresses several levels of functionality, from the production of simple correspondence to large document generation in which many people from different departments have input.

(3) *Desktop Publishing (DTP)* - Desktop publishing refers to the page-design software programs that allow small and midsized organizations to publish printed documents (brochures, catalogs, newsletters, reports, etc.) from the desktop. The primary functions of DTP software include the manipulation of the following functions:

• Layout and design of columns

• Text manipulation (font type)

• Graphic manipulation

• Print Control (color type, paper type)

(4) *Electronic Publishing* - Electronic publishing includes composition, printing, and editing software for documents containing multiple typefaces and graphics, including charts, diagrams, computer-aided design (CAD) drawings, line art, and photographs. Electronic publishing products may also have different data formats such as text, graphs, images, voice and video.

The fundamental difference between electronic publishing and desktop publishing is that electronic publishing facilitates document management and control from a single point, regardless of how many authors/locations work on a document. Desktop publishing (DTP), on the other hand, is considered a personal productivity tool and is generally a lower-end product residing on a personal computer.

(5) *Graphics* - Graphics packages that are used for presentations or freehand drawings and/or are ancillary to desktop publishing are part of office systems. Thus, the graphics component of office systems sector includes the following elements:

• *Presentation graphics* represent the bulk of office systems graphics. Most presentations involve a combination of graphs and text. They are used to communicate a series of messages to an audience rather than to analyze data.

• *Paint and line art drawing programs* are used for illustrations, while page layout programs are used to integrate text and graphics.

- *Electronic form programs* allow users to create and print forms in-house. Some applications work with OCR scanners, allowing users to scan pictures and logos directly onto forms.

(6) *Document Imaging Software* - The software that allows users to manipulate (store, retrieve, print) images that have been scanned from paper documents. The applications that imaging software generates include: full text retrieval, document management, and database management. Document imaging software is a component of an imaging system. Hardware components of imaging systems include: scanners, image servers, workstations, optical drives, printers, and storage devices.

### e. Engineering and Scientific

Engineering and scientific activities encompass the following applications:

- Computer-aided design and engineering (CAD and CAE)

- Structural analysis

- Statistics/mathematics/operations research

- Mapping/GIS

- Computer-aided manufacturing (CAM) or CAD that is integrated with CAM is excluded from the cross-industry sector, as it is specific to the manufacturing industries. CAD or CAE that is dedicated to integrated circuit design is also excluded because it is specific to the semiconductor industry.

### f. Planning and Analysis

Planning and analysis consists of software products and information services in four application areas:

- Executive Information Systems (EIS)

- Financial modeling or planning systems

- Spreadsheets

- Project management

### g. Sales and Marketing

Sales and marketing encompasses the following marketing/sales applications:

- Sales analysis

- Marketing management

- Demographic market planning models

## 3. Product/Service Category Reporting by Sector

This section describes how the product/service forecasts relate to the market sector forecasts. Exhibit 11 summarizes the relationships.

- *Processing Services* - The transaction processing services subcategory is forecasted for each industry and cross-industry market sector. The utility and other processing services subcategories are forecasted in total in the general market sector.

- *Turnkey Systems* - Turnkey systems is forecasted for the 15 industry and 7 cross-industry sectors. Each component of turnkey systems is forecasted in each sector.

- *Applications Software Products* - Applications software products are forecast for the 15 industry and 7 cross-industry sectors.

- *Outsourcing* - Each of the outsourcing subcategories is forecasted for each of the 15 industry sectors.

- *Systems Integration* - Systems integration and each of the components of systems integration are forecasted for each of the 15 industry sectors.

- *Professional Services* - Professional services and each of its subcategories are forecasted for each of the 15 industry sectors.

Exhibit 11

## Product/Service Category versus
## Market Sector Forecast Content

| Product/Service Category | Product/Service Subcategory | Industry Sectors | Cross-Industry Sector | General |
|---|---|---|---|---|
| Processing Services | Transaction | ✔ | ✔ | |
| | Utility | | | ✔ |
| | Other | | | ✔ |
| Turnkey Systems | | ✔ | ✔ | |
| Applications Software Products | | ✔ | ✔ | |
| Outsourcing | Platform Ops. | ✔ | | |
| | Application Ops. | ✔ | | |
| | Desktop Svcs. | ✔ | | |
| | Network Svcs. | ✔ | | |
| | Applications Mgmt. | ✔ | | |
| | Business Ops. | ✔ | | |
| Systems Integration | | ✔ | | |
| Professional Services | | ✔ | | |
| Network Services | Network Appls. | ✔ | | |
| | Electronic Info. Svcs. | ✔ | | ✔ |
| Systems Software Products | | | | ✔ |
| Equipment Svcs. | | | | ✔ |

Source: INPUT

- *Network Services* - The network applications subcategory of network is services forecasted for each of the 15 industry sectors. Industry and cross-industry electronic information services are forecast in relevant market sectors. The remainder of electronic information services is forecasted in total for the general market sector.

- *Systems Software Products* - Systems software products are forecasted in total for the general market sector.

- *Equipment Services* - Equipment services and its subcategories are forecasted in total in the general market sector.

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- Clients make informed decisions more quickly and economically by using INPUT's services. Since 1974, information technology (IT) users and vendors throughout the world have relied on INPUT for data, research, objective analysis and insightful opinions to prepare their plans, market assessments and business directions, particularly in computer software and services.

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- Outsourcing options
- Systems plans
- Peer position

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# Table of Contents

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# Terms and Definitions

## A
## Introduction

- This document provides:

    - Definitions of the industry and market segments normally addressed by research projects.

    - A guide to the terminology employed in the written documents

    - Specification of the structure used for market analysis and forecasts

    Clients have the benefit of being able to track market forecast data from year to year against a proven and consistent foundation of definitions.

    Each year INPUT reviews its definitions with clients and makes changes if they are required. When changes are made, they are carefully documented and the new definitions and forecasts reconciled to the prior definitions and forecasts.

# B
# Market Forecast Structure

### 1. Market Sectors

- Market Sectors, or markets, are groupings of the buyers of products/services.  There are three market sector categories:

    - Vertical Industry markets, such as banking and finance, transportation, utilities, etc.  These are called "industry-specific" markets and are roughly aligned with US Government SIC codes.

    - Functional or Process markets, such as human resources, accounting, etc., which are common across industries These are called "cross-industry" markets.

- Generic markets, which are neither industry- nor application-specific, such as the market for systems software products, and much of the Internet and electronic content (database) markets.

### 2. Product/Service Categories

- Product/Service Categories are groupings of products and services that satisfy a given need.  While Market Sectors specify who the buyer is, Product/Service Categories specify what the customer is buying.

- INPUT's main emphasis is on information technology (IT)-based solutions.  Consequently analysis and forecasts are heavily applications and industry oriented:  they also focus on software and services rather than on the basic technology or hardware.

### 3. Market Size Measurement and Terminology

- All market sizes are estimates of user expenditures.

- By focusing on user expenditures, INPUT avoids two problems that are related to the distribution channels for various categories of services:

    - Double counting, which can occur by using total vendor revenues to express market sizes when there is significant reselling within the industry(e.g., software sales to turnkey vendors for repackaging and resale)

- Missed counting, which can occur when sales go through indirect channels such as mail order retailers

- Expenditures for products and services provided by a vendor that is part of the same parent corporation as the buyer are captive expenditures. These expenditures are not included in INPUT market forecasts. They are used in some vendor size rankings.

- Expenditures to vendors that have a different parent corporation from the buyer are noncaptive or open. These expenditures are open to competitive bid, they form INPUT market forecasts.

- When questions arise about the proper place to count these expenditures, INPUT addresses them from the buyer's viewpoint—that is, expenditures are categorized according to what customers perceive they are buying.

- Terminology describing market and organizational relationships is as follows:

  - "Vendor" – the purveyor of goods or services.

  - "Buyer" – the person or organization that purchases goods or services.

  - "User" – the person or organization that employs the goods and services directly or through an internal intermediary

  - "Customer" – the company or organization in which buyers and users are employed.

  - "End User" – use of this derogatory term is avoided as much as possible. It might be used to differentiate an individual who uses a product/service from the department or company in which they work which is described as the "user" of a product/service. Preferred terminology would be "individual user" or "personal user".

  - At times the "customer", "buyer" and "user" may be the same individual or unit but many times they are separate.

## C
## Analytical Framework

- As mentioned above INPUT analyses the use of IT (broadly computer and telecommunications devices and systems) rather than the technology itself.

- This orientation emphasizes applications and solutions.

- Historically IT applications and solutions have primarily supported business and other processes

- Today and in future they are increasingly an integral part of the process itself, resulting in EB

- INPUT now analyses two broad industry segments

  - Electronic Business

  - IT Software and Services particularly those that enable and support EB

## 1. Electronic Business (EB)

- EB is the combination of Information Technology and business process to form a new way of working.

  EB is the most important change affecting organizations as we go into the 21st Century.

- Electronic Business is the embedding of IT into a business or other organizational process in order to enable that process to operate.

  - It differs from the old model whereby IT was used to support the operation of such a process.

  - A critical difference is whether or not the process can operate at all if the IT system is inoperable.

    - A reservation clerk that uses a reservation system to make airline reservations is not EB

    - UAL's on-line system whereby a passenger makes a booking directly is EB

- INPUT analyses three levels of EB as shown in Exhibit 1.

**Electronic Business World**



EB Processes

EB Enablers

EB Support & Services
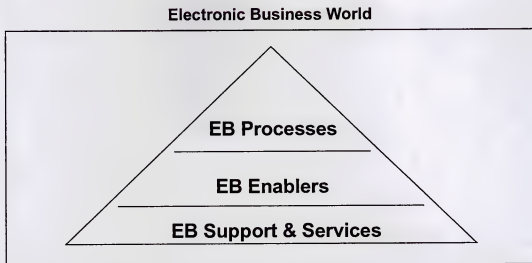
Source: INPUT

- EB Processes are those normal organizational processes to which IT is applied. They fall into two categories

  - Industry Specific

  - Cross Industry (Function) Specific

- Industry specific EB Processes:

  - Electronic Banking, Electronic Government, Electronic Retailing, Electronic Brokerage, etc. (sometimes shortened to e- Banking, e- Retailing, etc.)

  - They can also be non-information intensive as e-Manufacturing, e-Utilities, etc.

  - The information content of supposedly non-information companies is increasing; there are utility companies without any generation capability, for example.

- Cross industry EB Processes:

  - Electronic Commerce (EC); this is inter company trading

  - Electronic HR

  - Electronic Customer Service

- Only certain EB processes are analyzed (and defined) by INPUT at present

  - Electronic Banking

  - Electronic Commerce

  - Electronic Government

  Definitions for each of these are provided in the following sections.

## i) Electronic Banking

- Electronic banking is the application of IT to enable customers to carry out banking functions directly through computer networks

- Electronic banking includes all the major banking functions:

  - Retail Banking, including Home Banking

  - Wholesale or Commercial Banking including Cash Management and similar services

  - Trust and Investment Services.

- A particular emphasis is on the impact of digital money (ecash, electronic cash, cybercash or whatever other terminology is employed)

- Because of the relationship of e-banking with electronic commerce, there is a strong emphasis on the analysis of the payment process which involves banks but is not strictly banking

## ii) Electronic commerce

- Information technology is playing a major role in reengineering organizations internal and external operations, such as the value chain or Trading Communities in which companies operate. As a result electronic commerce is growing rapidly.

- Electronic commerce is the use of IT systems to carry out the interorganizational business processes of buying and selling goods and services.

- A trading community is a group of organizations—commercial and non-commercial—involved in the trade of a particular type of goods or services, such as food, steel, electronics, etc.

- Electronic Commerce is strictly trade among organizations. However, contemporary use now includes what is actually Electronic Retailing (selling to individuals as consumers). INPUT therefore covers:

  – Business to Business (BTB)

  – Business to Consumer (BTC)

- The impact of the Internet in Electronic Commerce will be huge. However, the majority of Electronic Commerce (in terms of the value of goods/services traded) is today non-Internet based and will continue to be so for the next few years. Electronic Commerce delivery mechanisms are analysed into

  – Internet Commerce

  – Non-Internet Commerce

- A related factor in Electronic Commerce is the nature of the relationship between buyer and seller:

  – In pre-negotiated EC, there is a prior agreement between the buyer and seller, a contract. Orders and payments are placed against that contract

  – In ad-hoc EC there is no prior agreement. The buyer may or may not be a repeat customer.

- Electronic Commerce markets are measured in three ways:

  – Value of goods and services traded

  – Volume of transactions

  – Value (cost) of operation of the IT network infrastructure supporting EC

- To the extent possible EC markets are mapped into categories of goods and services corresponding to industry sector definitions:

  – Manufactured goods

    – Travel

    – Financial services (Investment and Banking)

    – Insurance

    – Business Services.

### iii) Electronic Government

- Electronic government is the application of IT to enable agencies and their publics to carry out government functions directly through computer networks

    – Legislature

    – Judicial and Police

    – Administrative

- To date there is little legislative activity (electronic citizen voting) or judicial and police activity (electronic trials). Most of the activity is in service-to-the-citizen areas, such as license renewal

- One major area of electronic government activity is procurement. The U.S. Federal Government is placing great emphasis on reducing the cost of and streamlining the procurement process through the use of IT, particularly the "Information Superhighway" or Internet.

### b. Electronic Business Enablers

- EB Enablers are these tools and services that allow or enable EB to be carried out. Enablers are primarily:

    – Networks (Internet being the most important)

    – Software (Particularly Enterprise Resource Planning (ERP) and Customer Management Systems (CMS) software)

    – Data (Particularly Data Warehousing/Mining)

- The two areas of EB Enablers covered by INPUT in detail are:

  - Enterprise Applications Solutions

  - Internet/Intranet

- Enterprise Applications Solutions are IT systems based on software packages from companies such as SAP, Baan, Oracle and Peoplesoft. This software includes Enterprise Resource Planning (ERP) and similar software: also included is customer management systems (CMS).

  - Solutions are made of the packages and implementation

  - Implementation and support are often provided by third party service companies.

- Internet is an aggregation of open networks that allow universal access based on standard protocols.

- Intranets are private networks using Internet protocols, technology and in some cases services.

- Internet services themselves may be used in two ways:

  - Completely open allowing public access to a server, content or application: qualifiers may subsequently be applied.

  - Privately; where an organization only allows access to a limited set of people or organizations.

- Some people use the term 'Extranet' signifying an Intranet that is accessible by people or organizations other than the Intranet owner. INPUT does not generally use this term as the boundaries of organizations are almost never rigid these days so that Intranets almost be definition often extend beyond the organization chart.

c. **EB Support and Services**

- EB Support and Services activities either operate a business process directly (Business Process Outsourcing) or support that operation. Two segments analyzed are:

  - Customer services and support keep the EB operating through disasters, upgrades and routine maintenance events.

- Operational services includes outsourcing, computer processing services and network services

- IT Customer Services and Support covers traditional product maintenance and support. It includes:

  - Computer and communications

  - Equipment and software

  - Environmental services

  - Maintenance

  - Call centers, helpdesk, interactive services

  - Non-IT services

- Electronic Customer Service will be added as an EB Process program in the near future

  - Customer Service in all industries is changing rapidly

  - Customer Management Systems (CMS) are increasingly technology based

- Operational Services are those services that provide continuous computers/network operations and/or support.

  - IT Outsourcing

  - Business Process Outsourcing

  - Processing Services

  - Network Services

    - ISPs

    - Other Services.

- Outsourcing is an outgrowth of facilities management (a popular 1970s term). It involves long term contracts for significant processes.

  – IT outsourcing is the contracting of various types of IT services.

  – The scope of outsourcing has changed; it is no longer just data center focused; network management, DTS, application management, etc. have been added

  – Business Process Outsourcing is the contracting for IT-based processes (e.g. electronic commerce or customer services); it is the natural outgrowth of the embedding of IT into business processes.

  – Processing and network services contracts can be very similar in nature to outsourcing contracts but do not involve long term commitments

- Internet services are most often Network Services. However, transaction services that simply use the Internet for connection are classified as processing services.

- Because of the interaction of business process, computer processing and networks in this area, there is a high potential for overlap, double counting, poor definition and confusion. This is compounded by rapid change in the environment largely caused by the Internet phenomenon.

## 2. IT Industry Structure

# D

## IT Software and Services Industry

- IT Software and Services are computer/communications related products and services that customers buy to develop and/or use in IT systems

- This has been changed from 'Information Services' since the latter letter is increasingly used to describe 'content services' such as those delivered electronically by the Internet or other means.

- In general, the IT S & S market does not involve providing equipment to users. The exception is when the equipment is part of an overall service offering such as a turnkey system, an outsourcing contract, or a systems integration project.

- The IT S & S market excludes pure telecommunication carrier services (i.e., data or voice communications circuits such as T-1 carriers). However, where information transport is associated with a network-based service (e.g., electronic data interchange services), or cannot feasibly be separated from other bundled services (e.g., some outsourcing contracts), the transport costs are included as part of the IT S & S market.

- IT Software and Services typically involve one or more of the following:

  - Platform and development products and services:

    - Packaged software products, including systems software or applications software (called Software Products)

    - A combination of computer equipment, packaged software and associated support services that will meet an applications systems need (called Turnkey Systems)

    - A combination of products (software and equipment) and services in which the vendor assumes responsibility for the development of a custom solution, or part of a solution, to an information systems need (call Systems Integration)

    - People services that support users in planning, developing and operating information systems (called Professional Services)

  - Operational services:

- Services that provide operation and management of all or a significant part of a user's information systems or telecommunications functions under a long-term contract (called Outsourcing)

- Use of vendor-provided computers to develop or run applications or provide services such as disaster recovery or data entry (called Processing Services)

- Services that provide or support the operation of a customer's computer/communications network or network facility; these are typically services such as Internet services provision (ISPs), value added network services (VANs), electronic mail services, etc.

- Services that provide network access to and use of public and/or proprietary information such as financial data bases and news (called Electronic Content Services).

- The analytical framework of the IT S & S industry consists of the following interacting factors:

  – Overall and industry-specific business environment (trends, events and issues)

  – Technology environment; user/buyer IT requirements

  – Size and structure of markets; vendors and their products, services and revenues; distribution channels; and competitive issues.

- A particular aspect of the whole industry is the Internet:

  – The Internet will have an increasing impact on each product/service category in the IT software and services industry.

  – Internet related markets are defined as subsets within each of the categories

  – This allows aggregation into an overall Internet market.

# D
## IT Software and Services Industry Definitions

Expenditures for work performed by organizations other than the package vendor are counted in the professional services delivery mode. Fees for work related to education, consulting, and/or custom modification of software products are also counted as professional services, provided such fees are charged separately form the price of the software product itself.
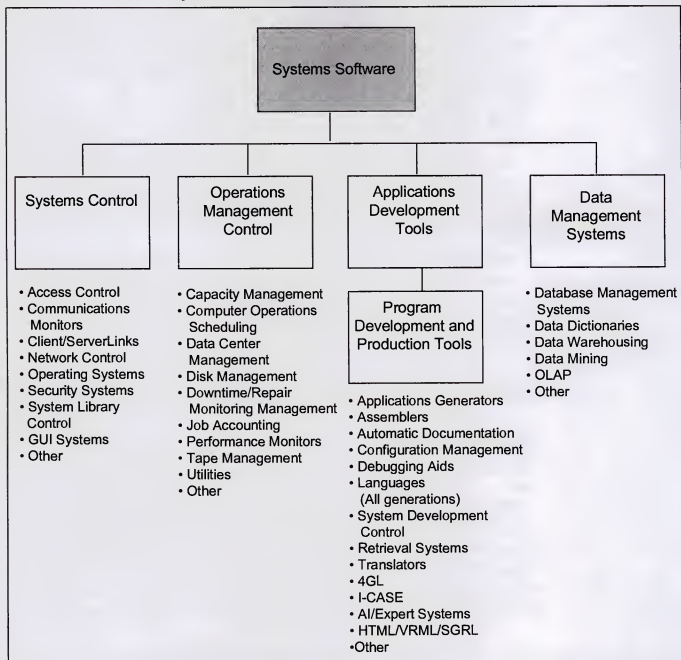
### a. Systems Software Products

Systems software products enable the computer/communications system to perform basic machine-oriented or user interface functions. INPUT divides systems software products into four submodes. See Exhibit 2.

- Systems Control Products - Software programs that manage computer system resources and control the execution of programs. These products include operating systems, emulators, network control, library control, windowing, access control, and spoolers.

- Operations Management Tools - Software programs used by operations personnel to manage the computer system and/or network resources and personnel more effectively. Included are performance measurement, job accounting, computer operation scheduling, disk management utilities, and capacity management.

- Applications Development Tools - Software programs used to prepare applications for execution by assisting in designing, programming, testing, and related functions. Included are traditional programming languages, 4GLs, data dictionaries, database management systems, report writers, project control systems, CASE systems and other development productivity aids.

- Database Management Systems - Database management systems (DBMSs), data dictionaries and database-related management software

Exhibit 2

## Systems Software Products Market Structure

```
                        ┌─────────────────────┐
                        │  Systems Software   │
                        └─────────────────────┘
```

| Systems Control | Operations Management Control | Applications Development Tools | Data Management Systems |
|---|---|---|---|

**Systems Control**
- Access Control
- Communications Monitors
- Client/ServerLinks
- Network Control
- Operating Systems
- Security Systems
- System Library Control
- GUI Systems
- Other

**Operations Management Control**
- Capacity Management
- Computer Operations Scheduling
- Data Center Management
- Disk Management
- Downtime/Repair Monitoring Management
- Job Accounting
- Performance Monitors
- Tape Management
- Utilities
- Other

**Applications Development Tools**

Program Development and Production Tools
- Applications Generators
- Assemblers
- Automatic Documentation
- Configuration Management
- Debugging Aids
- Languages (All generations)
- System Development Control
- Retrieval Systems
- Translators
- 4GL
- I-CASE
- AI/Expert Systems
- HTML/VRML/SGRL
- Other

**Data Management Systems**
- Database Management Systems
- Data Dictionaries
- Data Warehousing
- Data Mining
- OLAP
- Other

*Source: INPUT*

INPUT also forecasts systems software products by platform: mainframe, minicomputer and workstation/PC. These terms reflect a traditional view of processing platforms based upon size or computational capability. In 1996 reports, INPUT will use more contemporary terms for the three platforms based upon functionality, not size or processing power. These will be: enterprise server, departmental server and client.

### b. Applications Software Products

Applications software products enable a user or group of users to support an operational or administrative process within an organization. Examples include accounts payable, order entry, project management and office systems. INPUT categorizes applications software products into two groups (see Exhibit 3):

- Industry Specific Applications Software Products - Software products that perform functions related to fulfilling business or organizational needs unique to a specific industry (or vertical) market and sold to that market only. Examples include software products to perform such functions as demand deposit accounting, MRPII, medical record keeping, automobile dealer parts inventory, etc.

- Cross-Industry Applications Software Products - Software products that perform a specific function that is applicable to a wide range of industry sectors. Examples include payroll and human resource systems, accounting systems, word processing and graphics systems, spreadsheets, etc.
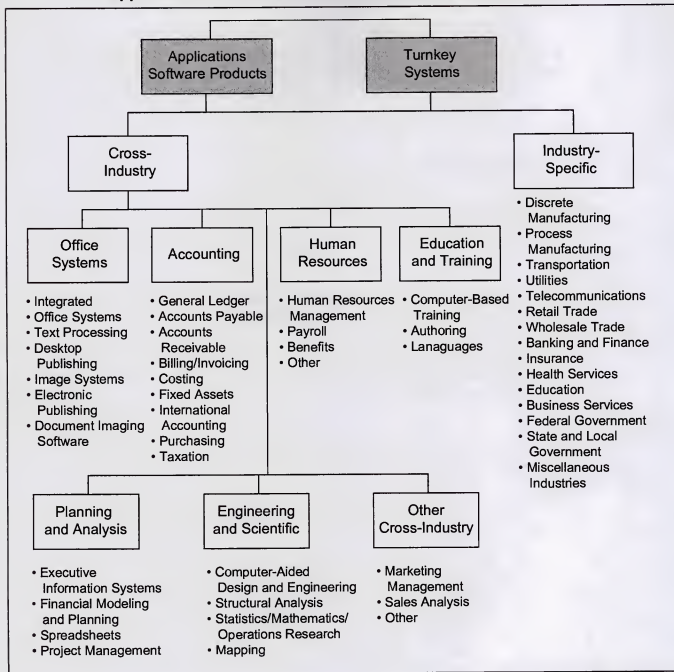
INPUT also forecasts the applications software product/service category by functional platform: enterprise server, departmental server, and client.

### 2. Turnkey Systems

A turnkey system integrates equipment (e.g., CPU, peripherals), systems software, and packaged applications software into a single product developed to meet a specific set of user requirements. Value added by the turnkey system vendor is primarily in the software and professional services provided. INPUT classifies turnkey systems into two groups, as it does for applications software products (see Exhibit 3)—those systems that are industry-specific and those applicable to the cross-industry markets. Many CAD/CAM systems and small business systems are turnkey systems.

Exhibit 3

## Application Products and Turnkey Systems Market Structure



Source: INPUT

Computer manufacturers (e.g., IBM or Apple) that combine software with their own general-purpose hardware are not classified by INPUT as turnkey vendors. Their software revenues are included in the appropriate software category.

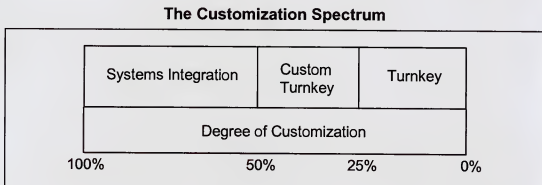Most turnkey systems are sold through channels known as value-added resellers (or VARs) and defined below:

- Value-Added Reseller (VAR) - A VAR adds value to computer hardware and/or software and then resells it to an end user. The major value added is usually applications software for a vertical or cross-industry market, but also may include many of the other components of a turnkey systems solution, such as professional services, software support, and applications upgrades.

Turnkey systems have three components:

- Equipment - computer hardware supplied as part of the turnkey system

- Software Products - prepackaged systems and applications software products

- Professional Services - services to install or customize the system or train the user, provided as part of the turnkey system sale

Exhibit 4 contrasts turnkey systems with systems integration. Turnkey systems are based on available software products that a vendor may modify to a modest degree.
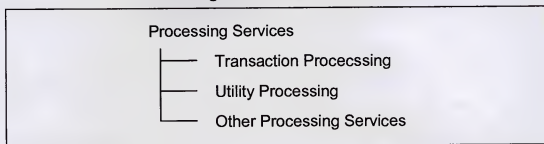
Exhibit 4

**The Customization Spectrum**

| Systems Integration | Custom Turnkey | Turnkey |
|---|---|---|
| Degree of Customization | | |

100%                    50%           25%         0%

*Source: INPUT*

### 3.  Processing Services

This product/service category includes three subcategories:  transaction processing, utility processing, and "other" processing services.  See Exhibit 5.

Exhibit 5

**Processing Services Market Structure**

```
        Processing Services
              ┌──── Transaction Procecssing
              ├──── Utility Processing
              └──── Other Processing Services
```

*Source: INPUT*

The three processing services subcategories are:

- Transaction Processing - The client uses vendor-provided information systems—including hardware, software and/or data networks—at the vendor or customer site to process specific applications and update client databases.  The application software is typically provided by the vendor.

- Utility Processing - The vendor provides basic software tools (language compilers, assemblers, DBMSs, graphics packages, mathematical models, scientific library routines, etc.), enabling clients to develop and/or operate their own programs or process data on the vendor's system.

- Other Processing Services - The vendor provides a service—usually at the vendor site—such as scanning and other data entry services, laser printing, computer output microfilm (COM), CD preparation and other data output services.  This category also includes backup, contingency and disaster recovery services.

### 4.  Outsourcing

Outsourcing (previously called Systems Operations and Facilities Management) was introduced as a product/service category in the 1990 Market Analysis and Systems Operations programs.
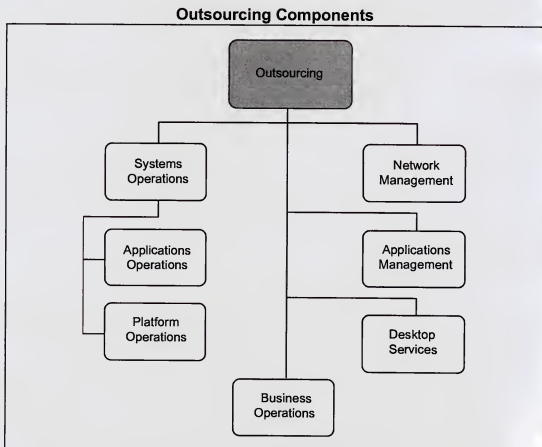
Outsourcing is a long-term (greater than one year) relationship between a client and a vendor in which the client delegates all, or a major portion, of an operation or function to the vendor. The operation or function may either be solely information systems outsourcing-based, or include information systems outsourcing as a major component (at least 30%) of the operation.

The critical components that define an outsourcing service are:

- Delegating an identifiable area of the operation to a vendor

- Single-vendor responsibility for performing the delegated function

- Intended, long-term relationship between the client and the vendor, where:

  - The contract term is for at least one year

  - The client's intent is not to perform the function with internal resources

- The contract may include non-information systems outsourcing activities, but information systems outsourcing must be an integral part of the contract.

For 1996, the outsourcing product/service subcategories have been defined as shown in Exhibit 6 and defined below:

Exhibit 6



**Outsourcing Components**

*Source: INPUT*

- Platform Operations - The vendor manages and operates the computer systems, to perform the client's business functions, without taking responsibility for the client's application systems.

- Applications Operations - The vendor manages and operates the computer systems to perform the client's business functions, and is also responsible for maintaining, or developing and maintaining, the client's application systems.

- Network Management - The vendor assumes responsibility for operating and managing the client's data communications systems. This may also include the client's voice communications resources. A network management outsourcing contract may include only the management services or it may cover the full costs of the communications services and equipment plus the management services.

- Desktop Services - The vendor assumes responsibility for the deployment, maintenance, and connectivity among the personal computers and/or workstations in the client organization. The services may also include performing the help-desk function. Equipment as well as services can be part of a desktop services outsourcing contract.

  Note: This type of client service can also be provided through traditional professional services where the contractual criteria of outsourcing are not present.

- *Applications Management* - The vendor has full responsibility for maintaining and upgrading some or all of the application systems that a client uses to support business operations and may also develop and implement new application systems for the client.

  An applications management contract differs from traditional software development in the form of the client/vendor relationship. Under traditional software development services, the relationship is project based. Under applications management, it is time and function based.

  These services may be provided in combination or separately from platform outsourcing.

- *Business Operations* - Business operations outsourcing (also known as business outsourcing or functional outsourcing) is a relationship in which one vendor is responsible for performing an entire business/operations function, including the information systems outsourcing that supports it. The information systems outsourcing content of such a contract must be at least 30% of the total annual expenditure in order for INPUT to include it in the outsourcing market. Examples of business operations that are outsourced include telephone company billing and employee benefits processing.

Outsourcing vendors now provide a wide variety of services in support of existing information systems. The vendor can plan, control, provide, operate, maintain and manage any or all components of the client's information systems environment (equipment, networks, applications systems), either at the client's site or the vendor's site.

Note: In the federal government market, systems operation services are also defined by equipment ownership with the terms "COCO" (Contractor-Owned, Contractor-Operated), and "GOCO" (Government-Owned, Contractor-Operated).

## 5. Systems Integration (SI)

Systems integration is a vendor service that provides a complete solution to an information system, networking, or automation development requirement through the custom selection and implementation of a variety of information system products and services. A systems integrator is responsible for the overall management of a systems integration contract and is the single point of contact and responsibility to the buyer for the delivery of the specified system function, on schedule and at the contracted price.

The components of a systems integration project (see Exhibit 7) are the following:

- Equipment - The information processing and communications equipment required to build the systems solution. This component may include custom as well as off-the-shelf equipment to meet the unique needs of the project. The systems integration equipment category excludes turnkey systems by definition.

- Software Products - Prepackaged applications and systems software products.

- IT-Related Professional Services - The value-added component that adapts the equipment and develops, assembles, or modifies the software and hardware to meet the system's requirements. It includes all of the professional services activities required to develop, implement, and, if included in the contract, operate an information system, including consulting, program/project management, design and integration, software development, education and training, documentation, and outsourcing and maintenance.

- Other Products and Services - Most systems integration contracts include other services and product expenditures that are not classified elsewhere. This category includes miscellaneous items such as engineering services, automation equipment, computer supplies, business support services and supplies, and other items required for a smooth development effort.

Exhibit 7

## Products and Services Included in
## Systems Integration Projects

*Equipment*
- Information systems
- Communications

*Software Products*
- Systems software
- Applications software

*IT Related Professional Services*
- Consulting
  - Feasibility and trade-off studies
  - Selection of equipment, network and software
- Program/project management
- Design/integration
  - Systems design
  - Installation of equipment, network, and software
  - Demonstration and testing
- Software development
  - Modification of software packages
  - Modification of existing software
  - Custom development of software
- Education/training and documentation
- Systems operation/maintenance

*Other Miscellaneous Products/Services*
- Site preparation
- Data processing supplies
- Processing/network services
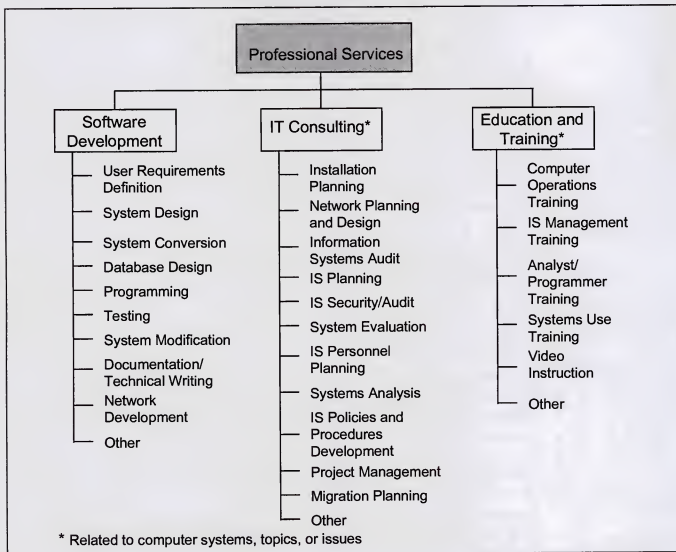- Data/voice communication services

*Source: INPUT*

### 6. Professional Services

This product/service category includes three subcategories: consulting, education and training, and software development. Exhibit 8 provides additional detail.

Exhibit 8

**Professional Services Market Structure**



| Software Development | IT Consulting* | Education and Training* |
|---|---|---|
| User Requirements Definition | Installation Planning | Computer Operations Training |
| System Design | Network Planning and Design | IS Management Training |
| System Conversion | Information Systems Audit | Analyst/ Programmer Training |
| Database Design | IS Planning | Systems Use Training |
| Programming | IS Security/Audit | Video Instruction |
| Testing | System Evaluation | Other |
| System Modification | IS Personnel Planning | |
| Documentation/ Technical Writing | Systems Analysis | |
| Network Development | IS Policies and Procedures Development | |
| Other | Project Management | |
| | Migration Planning | |
| | Other | |

\* Related to computer systems, topics, or issues

*Source: INPUT*

The three subcategories are defined as follows:

- IT Consulting - Services include information technology consulting (related only to information systems, and not general business consulting) in a broad range of areas, including planning, design, audit, evaluation and analysis; information systems re-engineering; feasibility analysis and cost-effectiveness studies; and project management assistance. Services may be related to any aspect of the information system, including equipment, software, networks and outsourcing.

- Education and Training - Services that provide training and education or the development of training materials related to information systems and services for the information systems professional and the user, including computer-aided instruction, computer-based education, and vendor instruction of user personnel in operations, design, programming, and documentation. Education and training provided by school systems is not included. General education and training products are included as a cross-industry market sector.

- Software Development - Services include user requirements definition, systems design, contract programming, documentation, and implementation of software, performed on a custom basis. Conversion and maintenance services are also included.
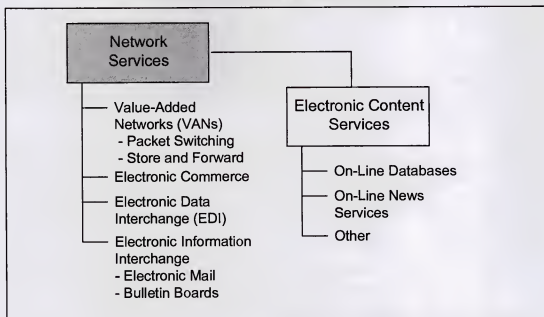
## 7. Network Services

Network services include a variety of telecommunications-based functions and operations, including those related to the Internet. This category includes two subcategories, as diagrammed in Exhibit 9. Each is defined in greater detail below.

*Electronic Information Services* - Electronic information services are data bases that provide specific information via terminal- or computer-based inquiry, including topics such as stock prices, legal precedents, economic indicators, periodical literature, medical diagnosis, airline schedules, and automobile valuations. The terminals used may be computers themselves, such as communications servers or personal computers.

Users inquire into and extract information from the databases and they may load extracted data into their own computer systems. The vendor does not provide data processing or manipulation capability as part of the electronic information service and users cannot update the vendor's databases. However, the vendor may offer other services (network applications or processing services) that do offer processing or manipulation capability.

Exhibit 9

## Network Services Market Structure



Source: INPUT

The two major categories of electronic information services are:

- On-line Databases - Structured, primarily numerical data on economic and demographic trends, financial instruments, companies, products, materials, etc.

- On-line News (Text) Services - Unstructured, primarily textual information on people, companies, events, etc. These are most often news services.

While electronic information services have traditionally been delivered via networks, there is a growing trend toward the use of CD ROM (optical disks) to support or supplant on-line services, and these optical disk-based systems are included in the definition of this delivery mode.

*Network Applications Services* - The three types of network applications services are:

- *Value-Added Network Services (VAN Services)* - VAN services are enhanced transport services that involve adding such functions as automatic error detection and correction, protocol conversion, and store-and-forward message switching to the provision of basic network circuits.

  VAN services were originally provided only by specialized VAN carriers (e.g., Tymnet and Telenet); today, these services are also offered by traditional common carriers (e.g., AT&T and Sprint). Meanwhile, the VAN carriers have also branched into the traditional common carriers' markets and are offering unenhanced basic network circuits as well.

- *Electronic Data Interchange (EDI) Services*- Application-to-application electronic exchange of business data between trade partners or facilitators using a telecommunications network.

- *Electronic Information Interchange*- The transmission of messages across an electronic network managed by a services vendor, including electronic mail, voice mail, voice messaging, and access to Telex, TWX, and other messaging services. This also includes bulletin board services.

## 8. Equipment Services

The equipment services product/service category includes two subcategories. Both deal with the support and maintenance of computer equipment.

- Equipment Maintenance - Services provided to repair, diagnose problems, and provide preventive maintenance both onsite and offsite for computer equipment. The costs of parts and other supplies are excluded. These services typically are provided on a contract basis. Equipment is divided into three broad groupings, depending upon function: enterprise servers, departmental servers, and clients. These functional definitions replace INPUT's earlier platform-related categories of mainframe, minicomputer, and workststation/PC, respectively.

- Environmental Services - These services comprise equipment and data center-related special services such as cabling, air conditioning and power supply, equipment relocation, and similar services.

L

## Computer/Communications Equipment

- *Equipment maintenance*: the repair or routine preventive maintenance of computer systems hardware or hardware components. Included are associated support activities such as telephone support, problem analysis and remote diagnostics. Contracts may be for one or more years; alternating repairs may be effected on an ad hoc basis.

- *Environmental services* are defined as all planning and implementation services which affect the environments in which computer platforms are expected to run. For these purposes, environment can mean any of the following:

  – The computer room fixtures and fittings

  – Cabling between computers and other devices in a system or network

  – Physical environment, such as: electrical power, air conditioning, water cooling, smoke or fire detection equipments

  – Network attachments

  – Buildings in which computers or network devices or terminals must reside.

- Environmental services normally involve the installation, upgrade, repair or de-installation of some piece of equipment, but may be restricted to planning only.

- Computer Equipment - Includes all computer and telecommunications equipment that can be separately acquired with or without installation by the vendor and not acquired as part of an integrated system. Unless otherwise noted in an INPUT forecast, computer equipment is only included where it is part of the purchase of services or software products (e.g., turnkey systems and systems integration).

- Peripherals - Includes all input, output, communications, and storage devices (other than main memory) that can be channel-connected to a processor, and generally cannot be included in other categories such as terminals

- Input Devices - Includes keyboards, numeric pads, card readers, light pens and track balls, tape readers, position and motion sensors, and analog-to-digital converters

- Output Devices - Includes printers, CRTs, projection television screens, micrographics processors, digital graphics, and plotters

- Communication Devices - Includes modems, encryption equipment, special interfaces, and error-control devices.

- Storage Devices - Includes magnetic tape (reel, cartridge, and cassette), floppy and hard disks, solid state (integrated circuits), bubble and optical memories, and mass storage devices

- Computer Systems - Includes all processors, from personal computers to supercomputers. Computer systems may require type- or model-unique operating software to be functional. This category excludes applications software and peripheral devices and processors or CPUs not provided as part of an integrated (turnkey) system.

- Personal Computers (PCs) - Smaller computers using 8-, 16-, or 32-bit computer technology, generally designed as desktop or laptop devices— e.g., to sit on a desktop or as a portable for individual use. Prices are generally less than $3,000. These devices form the bulk of the clients in a client/server environment.

- Workstations - High-performance, desktop, single-user computers often employing Reduced Instruction Set Computing (RISC). Workstations provide integrated, high-speed, local network-based services such as database access, file storage and backup, remote communications, and peripheral support. These products usually cost from $5,000 to $15,000.

- Departmental Servers - These are generally minicomputers or midsized computers priced from $5,000 to $350,000. Many client/server computers are in this category.

- Enterprise Servers - Traditional mainframe and supercomputers costing more than $350,000.

- *Client/server computing* - Client/server is an architecture that assembles applications software and databases, systems software, and computer and networking equipment into a usable form for the purpose of leveraging information technology investments. Broadly defined, it can include any kind of server, such as file servers and network servers, that are accessed by any kind of client, including a nonintelligent terminal. INPUT has elected to use the narrower and newer definition, by which application and data processing is shared between a client and a server. It is through the act of sharing that the greatest benefit is derived in terms of leveraging information technology investments. It is also the cause of the greatest change for vendors and users. As noted above, using client/server terminology, computers can be segmented into three broad categories—enterprise servers, departmental servers and clients— roughly corresponding to the platform categories: mainframes, minicomputers and workstation/PCs.

## N
## Sector Definitions

### 1. Industry Sector Definitions

Industry sectors are based on the most recent revision of the Standard Industrial Classification (SIC) code system, as shown in Exhibit 10.

Note: SIC code 88 is Personal Households. INPUT does not currently analyze or forecast information services in this market sector.

Exhibit 10

## Industry Sector Definitions

| Industry Sector | SIC Code | Description |
|---|---|---|
| Discrete Manufacturing | 23xx | Apparel and other finished products |
| | 25xx | Furniture and fixtures |
| | 27xx | Printing, publishing, and allied industries |
| | 31xx | Leather and leather products |
| | 34xx | Fabricated metal products, except machinery and transportation equipment |
| | 35xx | Industrial and commercial machinery and computer equipment |
| | 36xx | Electronic and other electrical equipment and components, except computer equipment |
| | 37xx | Transportation equipment |
| | 38xx | Instruments; photo/med/optical goods; watches/clocks |
| | 39xx | Miscellaneous manufacturing industry |
| Process Manufacturing | 10xx | Metal mining |
| | 12xx | Coal mining |
| | 13xx | Oil and gas extraction |
| | 14xx | Mining/quarrying nonmetallic minerals |
| | 20xx | Food and kindred products |
| | 21xx | Tobacco products |
| | 22xx | Textile mill products |
| | 24xx | Lumber and wood products, except furniture |
| | 26xx | Paper and allied products |
| | 28xx | Chemicals and allied products |
| | 29xx | Petroleum refining and related industries |
| | 30xx | Rubber and miscellaneous plastic products |
| | 32xx | Stone, clay, glass and concrete |
| | 33xx | Primary metal industries |
| Transportation Services | 40xx | Railroad transport |
| | 41xx | Public transit/transport |
| | 42xx | Motor freight transport/warehousing |
| | 43xx | U.S. Postal Service |
| | 44xx | Water transportation |
| | 45xx | Air transportation (including airline reservation services in 4512) |
| | 46xx | Pipelines, except natural gas |
| | 47xx | Transportation services (including 472x, arrangement of passenger transportation) |

*Source: INPUT*

Exhibit 10 (continued)

## Industry Sector Definitions

| Industry Sector | SIC Code | Description |
|---|---|---|
| Telecommunications | 48xx | Communications |
| Utilities | 49xx | Electric, gas and sanitary services |
| Retail Trade | 52xx<br>53xx<br>54xx<br>55xx<br>56xx<br>57xx<br><br>58xx<br>59xx | Building materials<br>General merchandise stores<br>Food stores<br>Automotive dealers, gas stations<br>Apparel and accessory stores<br>Home furniture, furnishings and accessory stores<br>Eating and drinking places<br>Miscellaneous retail |
| Wholesale Trade | 50xx<br>51xx | Wholesale trade - durable goods<br>Wholesale trade - nondurable goods |
| Banking and Finance | 60xx<br>61xx<br>62xx<br><br>67xx | Depository institutions<br>Nondepository credit institutions<br>Security and commodity brokers, dealers, exchanges and services<br>Holding and other investment offices |
| Insurance | 63xx<br>64xx | Insurance carriers<br>Insurance agents, brokers and services |
| Health Services | 80xx | Health services |
| Education | 82xx | Educational services |

*Source: INPUT*

Exhibit 10 (continued)

## Industry Sector Definitions

| Industry Sector | SIC Code | Description |
|---|---|---|
| Business Services | 65xx | Real estate |
| | 70xx | Hotels, rooming houses, camps, and other lodging places |
| | 72xx | Personal services |
| | 73xx | Business services (except hotel reservation services in 7389) |
| | 7389 | Hotel reservation services |
| | 75xx | Automotive repair, services and parking |
| | 76xx | Miscellaneous repair services |
| | 78xx | Motion pictures |
| | 79xx | Amusement and recreation services |
| | 81xx | Legal services |
| | 83xx | Social services |
| | 84xx | Museums, art galleries, and botanical/zoological gardens |
| | 86xx | Membership organizations |
| | 87xx | Engineering, accounting, research, management, and related services |
| | 89xx | Miscellaneous services |
| Federal Government | 9xxx | |
| State and Local Government | 9xxx | |
| Miscellaneous Industries | 01xx | Agricultural production - crops |
| | 02xx | Agricultural production - livestock/animals |
| | 07xx | Agricultural services |
| | 08xx | Forestry |
| | 09xx | Fishing, hunting, and trapping |
| | 15xx | Building construction - general contractors, operative builders |
| | 16xx | Heavy construction - contractors |
| | 17xx | Construction - special trade contractors |
| Personal Households | | |

*Source: INPUT*

## 2. Process or Cross-Industry Sector Definitions

These sectors or markets involve multi-industry applications such as human resource systems, accounting systems, etc. In order to be included in an industry sector, the service or product delivered must be specific to that sector only. If a service or product is used in more than one industry sector, it is counted as cross-industry.

INPUT only includes the turnkey systems, applications software products, and transaction processing services in the cross-industry sectors.

The cross-industry markets are:

### a. Accounting/Finance

Consists of such functions as:

- General ledger
- Financial management
- Accounts payable
- Accounts receivable
- Billing/invoicing
- Fixed assets
- International accounting
- Purchasing
- Taxation
- Financial consolidation

Excluded are accounting products and services directed to a specific industry, such as tax processing services for CPAs and accountants within the business services industry sector.

### b. Human Resources

Human resources consists of:

- Employee relations

- Benefits administration

- Government compliance

- Manpower planning

- Compensation administration

- Applicant tracking

- Position control

- Payroll processing

### c. Education and Training

Education and training consists of education and training for information systems professionals and users of information systems delivered as a software product, turnkey system, or through processing services. The market for computer-based training tools for the training of any employee on any subject is also included.

### d. Office Systems

Office systems consists of the following six categories:

(1) *Integrated Office Systems (IOSs)* - IOSs integrate the applications that perform common office tasks. Typically, these tasks include the following core applications, all of which are accessed from the same terminal, microcomputer, or workstation:

- Electronic mail/groupware

- Decision support systems

- Time management/workflow

- Filing systems/document management

IOSs enable to utilize applications that are resident on a number of hosts or servers, thus creating a corporate communication environment through

integrating line-of-business software with personal software productivity tools. IOSs capitalize on the cross-platform architectures of major vendors. Major vendors such as IBM, Microsoft, Netscape, Data General, Digital, Hewlett-Packard and NCR all offer IOSs.

(2) *Word Processing* - Word processing is the most common microcomputer application and is a basic application within the office systems sector. Word processing addresses several levels of functionality, from the production of simple correspondence to large document generation in which many people from different departments have input.

(3) *Desktop Publishing (DTP)* - Desktop publishing refers to the page-design software programs that allow small and midsized organizations to publish printed documents (brochures, catalogs, newsletters, reports, etc.) from the desktop. The primary functions of DTP software include the manipulation of the following functions:

- Layout and design of columns

- Text manipulation (font type)

- Graphic manipulation

- Print Control (color type, paper type)

(4) *Electronic Publishing* - Electronic publishing includes composition, printing, and editing software for documents containing multiple typefaces and graphics, including charts, diagrams, computer-aided design (CAD) drawings, line art, and photographs. Electronic publishing products may also have different data formats such as text, graphs, images, voice and video.

The fundamental difference between electronic publishing and desktop publishing is that electronic publishing facilitates document management and control from a single point, regardless of how many authors/locations work on a document. Desktop publishing (DTP), on the other hand, is considered a personal productivity tool and is generally a lower-end product residing on a personal computer.

(5) *Graphics* - Graphics packages that are used for presentations or freehand drawings and/or are ancillary to desktop publishing are part of office systems. Thus, the graphics component of office systems sector includes the following elements:

- Presentation graphics represent the bulk of office systems graphics. Most presentations involve a combination of graphs and text. They are used to communicate a series of messages to an audience rather than to analyze data.

- Paint and line art drawing programs are used for illustrations, while page layout programs are used to integrate text and graphics.

- Electronic form programs allow users to create and print forms in-house. Some applications work with OCR scanners, allowing users to scan pictures and logos directly onto forms.

(6) *Document Imaging Software* – The software that allows users to manipulate (store, retrieve, print) images that have been scanned from paper documents. The applications that imaging software generates include: full text retrieval, document management, and database management. Document imaging software is a component of an imaging system. Hardware components of imaging systems include: scanners, image servers, workstations, optical drives, printers, and storage devices.

### e. Engineering and Scientific

Engineering and scientific activities encompass the following applications:

- Computer-aided design and engineering (CAD and CAE)

- Structural analysis

- Statistics/mathematics/operations research

- Mapping/GIS (Geographic Information Systems)

- Computer-aided manufacturing (CAM) or CAD that is integrated with CAM is excluded from the cross-industry sector, as it is specific to the manufacturing industries. CAD or CAE that is dedicated to integrated circuit design is also excluded because it is specific to the semiconductor industry.

### f. Planning and Analysis

Planning and analysis consists of software products and information services in four application areas:

- Executive Information Systems (EIS)

- Financial modeling or planning systems

- Spreadsheets

- Project management

**g. Sales and Marketing**

Sales and marketing encompasses the following marketing/sales applications:

- Sales analysis

- Marketing management

- Demographic market planning models

**h. Customer Care/Services**

- Support

- Repair/diagnostics

- Help desk

- Consulting

**i. Logistics**

- Invoice management

- Replenishment

- Distribution

**3. Product/Service Category Reporting by Sector**

This section describes how the product/service forecasts relate to the market sector forecasts. Exhibit 11 summarizes the relationships.

- Processing Services - The transaction processing services subcategory is forecasted for each industry and cross-industry market sector. The utility and other processing services subcategories are forecasted in total in the general market sector.

- Turnkey Systems - Turnkey systems is forecasted for the 15 industry and 7 cross-industry sectors. Each component of turnkey systems is forecasted in each sector.

- Applications Software Products - Applications software products are
  forecast for the 15 industry and 7 cross-industry sectors.

- Outsourcing - Each of the outsourcing subcategories is forecasted for each
  of the 15 industry sectors.

- *Systems Integration* - Systems integration and each of the components of
  systems integration are forecasted for each of the 15 industry sectors.

- *Professional Services* - Professional services and each of its subcategories
  are forecasted for each of the 15 industry sectors.

Exhibit 11

## Product/Service Category versus Market Sector Forecast Content

| Product/Service Category | Product/Service Subcategory | Industry Sectors | Cross-Industry Sector | General |
|---|---|---|---|---|
| Processing Services | Transaction | ✓ | ✓ | |
| | Utility | | | ✓ |
| | Other | | | ✓ |
| Turnkey Systems | | ✓ | ✓ | |
| Applications Software Products | | ✓ | ✓ | |
| Outsourcing | Platform Ops. | ✓ | | |
| | Application Ops. | ✓ | | |
| | Desktop Svcs. | ✓ | | |
| | Network Svcs. | ✓ | | |
| | Applications Mgmt. | ✓ | | |
| | Business Ops. | ✓ | | |
| Systems Integration | | ✓ | | |
| Professional Services | | ✓ | | |
| Network Services | Network Appls. | ✓ | | |
| | Electronic Info. Svcs. | ✓ | | ✓ |
| Systems Software Products | | | | ✓ |
| Equipment Svcs. | | | | ✓ |

*Source: INPUT*

- Network Services - The network applications subcategory of network is services forecasted for each of the 15 industry sectors. Industry and cross-industry electronic information services are forecast in relevant market sectors. The remainder of electronic information services is forecasted in total for the general market sector.

- *Systems Software Products* - Systems software products are forecasted in total for the general market sector.

- *Equipment Services* - Equipment services and its subcategories are forecasted in total in the general market sector.